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CLAIMS

1. A method for producing a metal alloy, in which in a vessel at overpressure a certain desired content of an alloying constituent which is gaseous in its normal state, is fed to said metal alloy, characterised in that

- the gaseous alloying constituent and an inert gas are added in such quantities to the atmosphere contained in the vessel that a particular initial concentration ratio between the gaseous alloying constituent and the inert gas exists in the atmosphere;

- the change over time in the gas pressure, the change over time in the concentration of the inert gas and in the gaseous alloying constituent in the atmosphere contained in the vessel, as well as the change over time in the mean gas temperature of the atmosphere contained in the vessel, are determined;

- taking into account the respective total pressure, the respective concentration of the inert gas, the respective concentration of the gaseous alloying constituent, as well as the respective gas temperature, the inert gas mass loss occurring as a result of lack of tightness of the vessel, of the atmosphere contained in the vessel, is determined;

- by means of the initial concentration ratio a theoretical mass loss of the gaseous alloying

constituent in the atmosphere is determined, said mass loss being the result of lack of tightness;

- by means of a comparison of the theoretical mass loss with the actual mass loss which is determined taking into account the respective actual concentration of the gaseous component in the atmosphere contained in the vessel, the mass fraction of the gaseous component which has made the transfer to the metal alloy is determined; and

- taking into account the mass fraction which has made the transfer to the metal alloy and the mass losses of the gaseous alloying constituent which have been lost by lack of tightness, this alloying constituent is admixed to the atmosphere contained in the vessel for such a period of time and in such quantities that after completion of the process, the metal alloy has the desired content of the gaseous alloying constituent.

2. A method according to claim 1, characterised in that by metered addition of the gaseous alloying constituent a certain total pressure and a certain partial pressure of the gaseous alloying constituent are maintained.

3. A method according to one of the preceding claims, characterised in that in addition to the gaseous alloying constituent, inert gas is added by metering.

4. A method according to one of the preceding claims, characterised in that metered addition of the

gaseous alloying constituent takes place irrespective of the inert gas.

5. A method according to one of the preceding claims, characterised in that metered addition of the gaseous component takes place by means of solid particles which contain the gaseous component in a bound form, with said particles when exposed to heat, releasing the gaseous alloying constituent at a known concentration.

6. A method according to one of the preceding claims, characterised in that the mean gas temperature is determined by measuring the temperature of the atmosphere contained in the vessel at least in one location, and on the basis of this measured temperature taking into account a previously empirically determined correlation, the mean gas temperature is determined.

7. A method according to one of claims 1 to 5, characterised in that the mean gas temperature is measured by means of a rise in pressure which is triggered in the vessel by a temporary addition of a known inert gas volume.

8. A method according to one of the preceding claims, characterised in that the gaseous component is nitrogen.

9. A method according to one of the preceding claims, characterised in that the inert gas is argon.

10. A method according to one of the preceding claims, characterised in that the metal alloy is a steel alloy.

11. A method according to one of claims 5 to 10, characterised in that the solid particles are added by metering in the form of powder or granulate.

12. A method according to claim 11, characterised in that the solid particles are formed by a metal nitride or metal carbonitride.

13. A method according to claim 12, characterised in that the particles contain silicon nitride, chromium nitride, manganese nitride and/or lime-nitrogen.

14. A method according to one of the preceding claims, characterised in that the metal alloy is placed in the vessel in solid form and in that a remelting process is carried out in the vessel.

15. A method according to claim 14, characterised in that the remelting process is carried out as an electroarc refining process or an electroslag refining process.

16. A method according to one of claims 14 or 15, characterised in that the volume of the metal alloy remelted per unit of time is registered and taken into account when determining the quantity of the gaseous alloying constituent added by metering.

17. A device for implementing the method according to one of claims 1 to 16, comprising

- a vessel for containing an atmosphere and a metal alloy at overpressure;

- a heating device by means of which a melt can be generated from the metal alloy;

- a metering device for feeding into the vessel an alloying constituent which in its normal state is gaseous;

- a metering device for feeding an inert gas into the vessel;

- a pressure sensor for registering the total pressure of the atmosphere contained in the vessel;

- a temperature sensor for registering the temperature of the atmosphere in at least one location;

- a device for determining the concentrations of the inert gas and the gaseous alloying constituent in the atmosphere contained in the vessel;

- an evaluation unit which evaluates the total pressure, the temperature of the atmosphere and the concentrations of the inert gas and the gaseous alloying constituent; and

- a control device which controls the metering of the inert gas and the gaseous alloying constituent depending on the result of the evaluation of the evaluation device.

18. A device according to claim 17, characterised in that a valve for releasing the atmosphere contained in the vessel is provided.

19. A device according to one of claims 17 or 18, characterised in that the heating device is designed in the way of an induction furnace or an electric arc furnace.

20. A device according to one of claims 17 to 19, characterised in that a metering device for feeding solid particles into the vessel is provided.

21. A device according to claim 20, characterised in that a device for registering the quantity of particles fed into the vessel by the metering device is provided, and in that during its evaluation, the evaluation device takes into account the quantity fed in.

22. A device according to one of claims 17 to 21, characterised in that a measuring device is provided which registers the melted volume of the metal alloy contained in the vessel, and in that during its evaluation, the evaluation device takes into account the value determined by the measuring device.